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AUTHOR Whitman, Maryann
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ABSTRACT

In 1948 archeologists verified that a now overgrown and urbanized landscape along the Saugus River (Massachusetts) was the site of the Saugus Iron Works from 1646 until 1648. That discovery led to a careful, though partly conjectural, reconstruction of the first successful integrated ironmaking plant in the colonial America. The early Puritan settlers of the Massachusetts Bay Colony needed an ironmaking factory to make tools and utensils for house building. Ironmasters recruited skilled and unskilled workers from the ironmaking regions in England. The reconstruction of the Saugus Iron Works helps people imagine the daily life of these early European settlers. This lesson is based on the National Register of Historic Places registration file, Saugus Iron Works National Historic Site, and primary documents from archives at the site. The lesson can be used in teaching units on the life and culture of the colonial United States, archeology, settlements and use of the land, or the history of technology. It is divided into eight sections: "About This Lesson"; "Getting Started: Inquiry Question"; "Setting the Stage: Historical Context"; "Locating the Site: Maps" (Saugus, Massachusetts and Surrounding Area; South Part of New England, 1634); "Determining the Facts: Readings" (An Ironworks in New England; An Ironworks Community); "Visual Evidence: Images" (Map of Saugus, Lynn and Nahant; Materials and Techniques for Making Iron; Excavation at the Saugus Site; Artifact Found at Saugus; Reconstructed Ironworks Buildings; Artists' Conception of Saugus Ironworks); "Putting It All Together: Activities" (Archeology; Researching Industries in the Local Community); and "Supplementary Resources." (BT)

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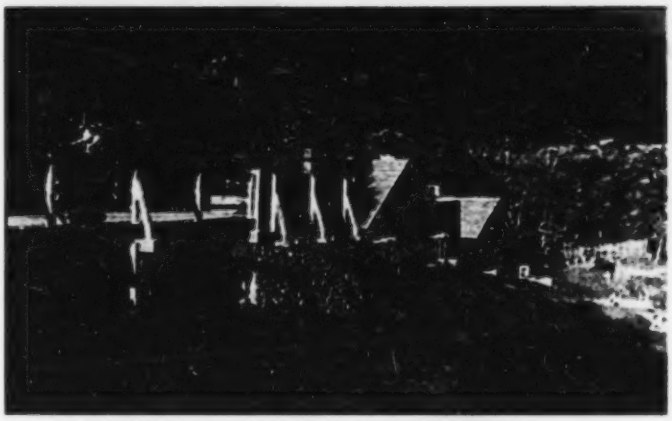
Saugus Iron Works: Life and Work at an Early American Industrial Site



(Saugus Iron Works National Historic Site)

The landscape had changed. Over time, parts of the river had silted in; marsh grasses, purple loosestrife, and other vegetation tumbled over the watercourse where iron-laden vessels once sailed. But a slag pile remained, and the Saugus River continued its flow along a prescribed course. Written records suggested that some 300 years past, this place served as the location of a prosperous iron industry. In 1948 archeologists were given the opportunity to survey and excavate the site and concluded that the written records were correct. Now overgrown and urbanized, from 1646 until 1668, this was the site of the Saugus Iron Works. That discovery led to a careful, though partly conjectural, reconstruction of the first successful integrated ironmaking plant in colonial America.

The early Puritan settlers of the Massachusetts Bay Colony undeniably needed an ironmaking factory. For those colonists, the first order of business was to build houses and plant crops. Essential to those tasks were iron tools and utensils: axes, saws, hoes, nails, pots, and kettles. Most colonists brought some needed tools and utensils with them. As the population grew, however, so did the need for more iron products. For more than 20 years this need was met by the Saugus Iron Works.

Ironmasters recruited skilled and unskilled workers from the ironmaking regions in England. These men were well acquainted with the white-heat of the blast furnace, the clanging noise of the great hammer, the hard work, and the need for constant alertness in this dangerous workplace. They knew how to endure the grueling motions that tore at their muscles, the suffocating smell of the molten metal, and the deafening atmosphere. The reconstruction of the Saugus Iron Works helps us to imagine the daily life of these early European settlers.

This lesson is based on Saugus Iron Works National Historic Site, one of the thousands of properties and districts listed in the National Register of Historic Places.

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About This Lesson

This lesson is based on the National Register of Historic Places registration file, "Saugus Iron Works National Historic Site," the National Park Service's visitor's guide, and primary documents from archives at the site. It was written by Maryann Whitman, a former Park Ranger at Saugus Iron Works National Historic Site. It was edited by Fay Metcalf and the Teaching with Historic Places staff.

Where it fits into the curriculum

Topics: This lesson could be used in teaching units on the life and culture of colonial America, archeology, settlements and use of the land, or the history of technology.

Time period: Colonial/Revolutionary

Objectives for students

1) To describe what is known about life and work at the Saugus Iron Works in the 17th century.

2) To determine the relationship between natural resources and the location and development of the ironworks.

3) To explain the role of the Saugus Iron Works in the start of the American iron industry.

4) To define the role archeology can play in helping us interpret the past.

5) To compare the industrial activity of the Saugus Iron Works with industry established in the early years of their own community.

Materials for students

The materials listed below either can be used directly on the computer or can be printed out, photocopied, and distributed to students.

1) two maps of Saugus, Massachusetts, and the surrounding area;

2) two readings about ironmaking and the people who worked in the industry;

3) one illustration, one chart, and one drawing of the area, the materials and

techniques for making iron, and the site;

4) three photos of excavation work at Saugus, an artifact, and reconstructed buildings.

Visiting the site

Located 10 miles north of Boston, Massachusetts, Saugus Iron Works National Historic Site is administered by the National Park Service. It may be reached from either Route 1 or Interstate 95. The park is open 9 a.m. to 5 p.m. April through October and 9 a.m. to 4 p.m. the rest of the year. It is closed January 1, Thanksgiving Day, and December 25. For more information, write to the Superintendent, Saugus Iron Works National Historic Site, 244 Central Street, Saugus, MA 01906, or visit the park's Web page at http://www.nps.gov/sair/

Getting Started
Inquiry Question

What might this be?

How to Use the Inquiry Question

Begin each lesson by asking students to discuss possible answers to the inquiry question that accompanies the Getting Started image. To facilitate a whole class discussion, you may want to print the page and use it to make an overhead transparency. The purpose of the exercise is to engage students' interest in the lesson's topic by raising questions that can be answered as they complete the lesson.

Rather than serving merely as illustrations for the text, images are documents that play an integral role in helping students achieve the lesson's objectives.

To assist students in learning how to "read" visual materials, you may want to begin this section by having them complete the Photo Analysis Worksheet for one or more of the photos. The worksheet is appropriate for analyzing both historical and modern photographs and will help students develop a valuable skill.

Photo Analysis Worksheet

Step 1:

Examine the photograph for 10 seconds. How would you describe the photograph?

Step 2:
Divide the photograph into quadrants and study each section individually. What details--such as people, objects, activities--do you notice?

Step 3:

What other information--such as time period, location, season, reason photo was taken--can you gather from the photo?

Step 4:

How would you revise your first description of the photo using the information noted in Steps 2 and 3?

Step 5:

What questions do you have about the photograph? How might you find answers to these questions?

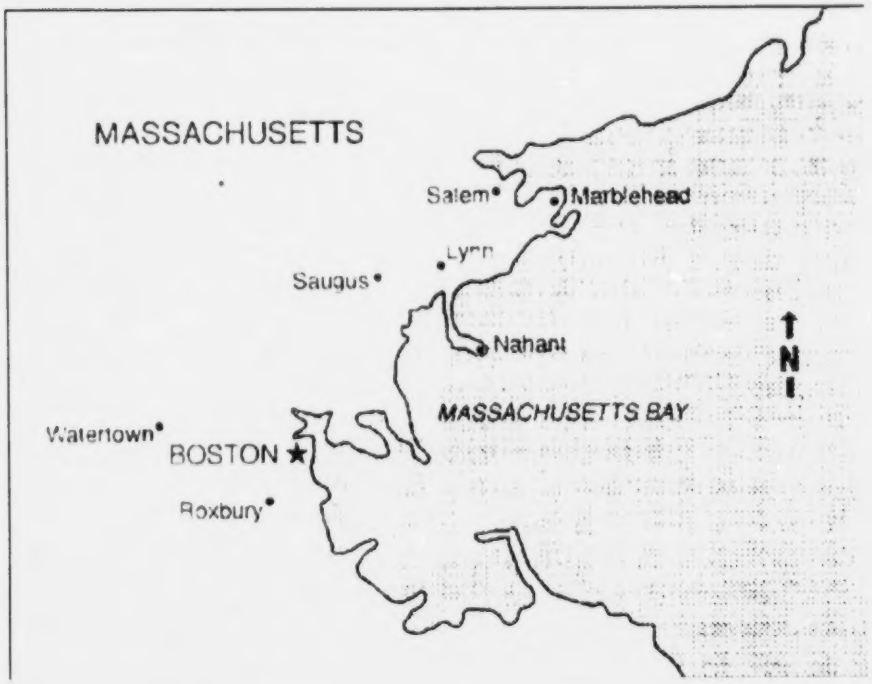
Setting the Stage

The Massachusetts Bay Colony found itself in an economic crisis when the Great Migration of the 1630s from England to the American colonies ended. As fewer ships came to New England, iron products became scarcer and more expensive. In 1641 the General Court of the Massachusetts Bay Colony enacted an ordinance for "encouragement to discovery of mines." By this legislation, anyone discovering mineral deposits in the colony would possess exclusive rights for 21 years. Colonists could buy land from Native Americans and, with the permission of the owners, could prospect for ore and develop mines on lands already held by settlers. The loss of a steady source of iron products from England and the discovery of iron ore precipitated a major industrial enterprise.

John Winthrop, Jr., son of the colony's governor, was particularly interested in developing an iron industry in Massachusetts. Educated at Trinity College in Dublin, Ireland, Winthrop had studied law and read widely in the sciences. He experimented in alchemy (an attempt to turn base metals into gold), medicine, and metallurgy. In 1641 he sailed to England to seek investors in a plan to start an ironworks in America. By 1643 Winthrop had found about two dozen men willing to invest in a "Company of Undertakers of the Iron Works in New England." Returning to the Massachusetts Bay Colony that year with a necessary team of skilled workmen, Winthrop established an ironworks along the Saugus River that operated from 1646 to 1668. In effect, he created the foundation for the American iron industry.

Some 300 years later, in 1948, the site where this ironworks had been established was excavated under the direction of archeologist Roland Wells Robbins. He and his crew found foundations of the buildings, remains of the holding ponds and the canal, half of the original blast furnace waterwheel and wheel pit, and more than 5,000 artifacts ranging from a 500-pound hammerhead to brass pins. As a result of the archeological evidence and historical documents that were found, the American Iron and Steel Institute decided to fund a reconstruction of the ironworks. The reconstructed site, based partly on conjecture, opened to the public in 1954. In 1968 the site became a unit of the National Park Service.

Locating the Site
Map 1: Saugus, Massachusetts and Surrounding Area



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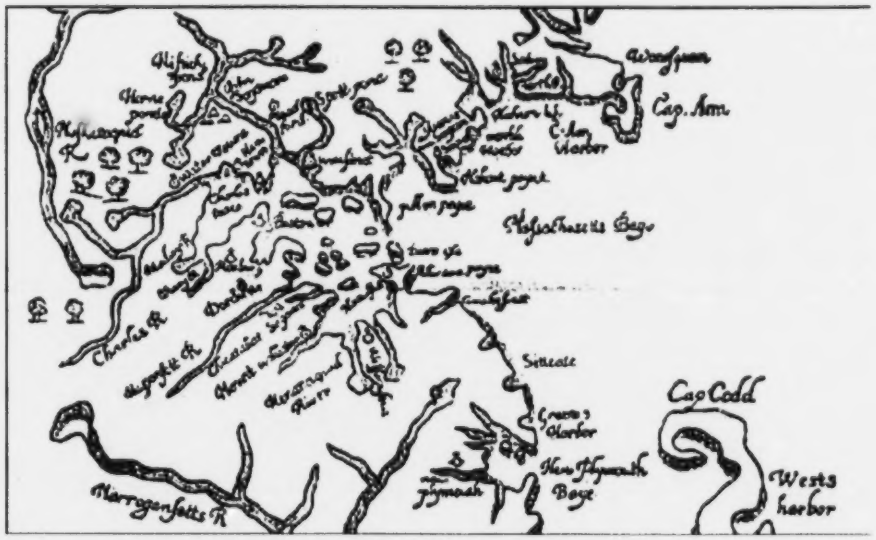
Locating the Site
Map 2: "The South part of New England, as it is Planted this yeare, 1634," (detail) from William Wood, New England's Prospect, London, 1634.



(Saugus Iron Works National Historic Site)

Questions for Maps 1 & 2

1. Using Map 1, locate the town of Saugus and list some of the nearby towns.

2. Examine Map 2, a map drawn by William Wood and published in 1634. Locate Saugus (Sagus) and any of the other towns you found on Map 1. Compare Map 1 (a modern-day map of the region) with Map 2 for changes in spelling and locations of the following towns: Marblehead, Salem, Nahant, Watertown, and Roxbury. What other changes do you notice?

3. What are some of the advantages of being near ports during the Colonial times?

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Determining the Facts
Reading 1: An Ironworks in New England

The Saugus Iron Works has been called the forerunner of American big business. It was an iron factory that converted raw iron ore into finished cast- and wrought-iron products. The process used to make these products was complicated and involved many separate steps. First, the raw materials for making iron were gathered near the blast furnace (see Drawing 1), which operated day and night. Colliers converted acres of trees into charcoal for fuel. Miners collected bog iron ore from nearby swampy areas and ponds. Flux, a mineral that rids bog ore of its impurities, was shipped from Nahant.

Charcoal, bog ore, and flux were dumped into the top of the stone furnace by workers called "fillers." The furnace was fired up, or "blown in" as the ironworkers called it. Beside the furnace rumbled one of the seven waterwheels at the ironworks which operated 18-foot bellows that helped to heat the furnace to a temperature of 3,000 degrees Fahrenheit. The liquid metal collected at the bottom of the furnace. Ironworkers had to continually skim the slag floating on top of the molten iron and dump it into the river. Once or twice in every 24 hours, the furnace was tapped by the "founder," the man in control of the furnace. The molten iron ran into trenches in the sand where it hardened into long cast iron bars. Smaller bars were poured off at an angle from the long bars. The configuration looked much like a mother pig feeding her piglets, so the long bar was called a "sow" and the smaller ones "pigs." Pig iron is another name for cast iron. Not all of the iron was cast into bars--skilled moulders were employed to make molds of items such as pots, pans, and kettles. Workers ladled liquid iron into these molds, which were buried in the sand floor of the casting shed. Cast iron is limited in use because it is brittle. Therefore, the cast-iron sows, which were the main product of the furnace, were taken to the forge (see Drawing 1) for refining.

With three fires crackling, four of the ironworks' waterwheels turning, three sets of bellows whooshing, and the 500-pound hammer crashing repeatedly on its anvil, the forge was the busiest and the noisiest of the ironworks buildings. There some 10 to 12 men worked to convert brittle cast iron into malleable wrought iron, a complicated process that required a high degree of skill. First, "finers" melted and refined sows. Repeated heating and hammering pounded many impurities from the iron. Flying sparks and pieces of hot metal constantly threatened men working in the forge. The noise of the 500-pound hammer cost many workers their hearing. The bulk of the iron at the forge was made into "merchant bars," three inches wide, one-and-a-half inches thick, and four to five feet long, which could be made into tools and used for building materials.

The rolling and slitting mill (see Drawing 1), situated just down the hill from the forge, contained the most advanced technology of all the machinery at the ironworks. It was

one of only a dozen slitting mills in the world at that time. Its essential machinery consisted of a pair of rollers for flattening the merchant bars into sheets called "flats" and a pair of slitters for slicing the flats into thin strips of rod used to make nails. The rollers and slitters had to turn in opposite directions in order for the bars to pass through them. The "mill wright," who operated the waterwheels, made sure the rollers and slitters operated at the same rate of speed. One waterwheel directly turned the lower set of rollers and slitters; the second waterwheel used gears to turn the top set. Flats produced here were used for making wheel rims, barrel hoops, and for repairing machinery at other ironworks. The nail rods provided the material for handmade nails, a valuable commodity in colonial America. These products were stored in an "ironhouse" or warehouse (see Drawing 1) until being loaded onto boats and shipped to either nearby American ports or to England.

Although the Saugus Iron Works operated for about 22 years, it eventually went out of business, a victim of mismanagement, high production costs, fixed prices, and competition from imported iron. The Saugus Iron Works produced respectable quantities of bar iron, but could not return a profit to its shareholders, who finally refused to advance more capital to the failing enterprise. The company's debts became so great that creditors brought suits to recover their loans. Court decisions caused production to decline and skilled workers to leave.

Records show that some ironworkers moved to different regions of New England where they continued to work in the iron industry. For example, James Leonard, who had been a forge worker at Saugus, became the manager of a forge in Bromingum in 1671 and a freeman (landowner) in 1688. Joseph Jenks, Jr., the son of a skilled craftsman, also worked at Saugus, beginning in 1649 when he was 16; in 1672 he erected his own forge at Pawtucket, Rhode Island. Others found jobs at established ironworks in New Jersey. Thus, it can be said that although Saugus Iron Works ultimately failed as an individual enterprise, it helped to lay the foundations for the iron and steel industry in the United States.

Questions for Reading 1

1. What were the three structures where ironmaking took place?

2. What were the saleable wrought-iron products manufactured at the ironworks? What would these semi-finished wrought-iron products be used for?

3. Why did the ironworks go out of business? What happened to the workers?

4. What influences did Saugus Iron Works have on the Massachusetts Bay Colony? Did the impact reach any further?

Reading 1 was compiled from the National Park Service's visitor's guide for Saugus Iron Works National Historic Site, 1981; E.N. Hartley, Ironworks on the Saugus (Norman: University of Oklahoma Press, 1957); Mary Stetson Clarke, Pioneer Iron Works (Philadelphia: Chilton Book Co., 1968); and William Gray, "Saugus Iron Works National Historic Site" (Essex County, Massachusetts), National Register of Historic Places Registration Form, Washington, D.C.: U.S. Department of the Interior, National Park Service, 1975.

Determining the Facts
Reading 2: An Iron Works Community

Soon after the ironworks opened, its shareholders developed the village of Hammersmith to house the approximately 100 people they employed. Named after the town in England from which many of the ironworkers had come, Hammersmith was a "factory town." Located just off the main road between Salem and Boston, Hammersmith was within easy traveling distance of the more than 20 communities then existing in the Massachusetts Bay Colony. Although officially a part of Lynn (Saugus was a Native American settlement that the English originally called Lynn and then later changed back to Saugus), Hammersmith was three miles from the Puritan meeting house and center of town, and therefore an independent settlement in many ways.

On the east side of the Saugus River stood small houses that housed the ironworkers and their families. The ironworks itself included a farm, blacksmith shop, warehouse, pottery shop, charcoal house, and other facilities. Food produced from the farm was used to feed the ironworkers during the workday. The manager of the ironworks, first Richard Leader and later John Gifford, lived in a house adjacent to the ironworks. Although there is a restored 17th-century house on the site of the ironworks, there is no definite evidence that it was actually the home of the managers. It is the right size, however. The manager's house would have been large compared with those of the workers because managers often entertained guests, including investors, merchants, and local gentry.

The ironworkers who lived at Hammersmith knew the intensity of labor, and the discomfort of the heat and noise associated with the iron industry. They worked 12 hour shifts at dangerous and dirty tasks. Women, whose time typically was devoted to household duties, normally did not work in the ironworks. Sometimes, however, they were expected to act as "deputy husbands." That meant that when needed, they took their husbands' place to negotiate and handle trade, fill orders, and supervise field hands. With few doctors in Colonial America, women also were responsible for growing and preparing herbs for medicinal purposes. Herbs also were important for textile dyes, insect repellents, and rat poisons; for preserving meat; and for dispelling odors in the home.

Because most of Hammersmith's workers and their wives were illiterate, there are no letters or diaries to help us develop a more clear and detailed account of their personal lives. We will never have their own words to tell us what they thought about working at the ironworks. Instead, we must piece together an impression of their lives from many sources.

Some information about the people of Hammersmith comes from church and government records, which indicate that only a few of the Hammersmith villagers were

Puritans. Although this may have caused some problems with their Puritan neighbors, many of the ironworkers and their children did marry into local Puritan families. Colonists from nearby farms and communities performed unskilled labor in the building of the ironworks and in working at the iron factory. This interaction with other colonists suggests that Hammersmith residents probably behaved much like other citizens of Lynn.

Other historical records show that two groups of workers were different from the English settlers, however. In 1651 about 35 Scottish prisoners of war were brought to New England to work at the ironworks rather than being placed in English prisons. The Scots lived at Hammersmith or with colonists from nearby communities who also worked at the ironworks. They received clothing, food, and tobacco as a condition of employment. Many cut wood for charcoal. It is likely that by the second or third generation they were accepted in the same way as other settlers. The other group consisted of Native Americans who already lived in Saugus when the Massachusetts Bay Colony was established. Company records show that at least two Indians chopped wood for the same wages as other workers.

More information about the daily activities of Hammersmith workers comes from analysis of the artifacts found at the town site. These include axes, fish hooks, a bullet mold, hoes, kettles, pots, spoons, a pewter baby nipple, a jaw harp, a pot hanger, oxen shoes, clay pipes, hammers, nails, and countless other items. From analysis of these items and from historical data about how other early New England settlers lived, archeologists conclude that even though the ironworkers of Hammersmith took part in an important chapter of America's industrial history, their daily lives were little different from those of the Puritan colonists around them.

Questions for Reading 2

1. Why could Hammersmith be described as a "factory town"?

2. How did women fit into the ironworks community?

3. Do you think the ironworkers would have gotten along with other settlers living near the ironworks? Why or why not?

4. Do you think the Scots felt they were better off to be in the colony rather than in English prisons?

5. What evidence suggests that people were paid for the work they did no matter who they were?

6. Can you imagine what daily life in the 17th century at Hammersmith was like? What do the artifacts the people left behind tell you?

Reading 2 was compiled from the National Park Service's visitor's guide for Saugus Iron Works National Historic Site, 1981; E.N. Hartley, Ironworks on the Saugus (Norman: University of Oklahoma Press, 1957); and Mary Stetson Clarke, Pioneer Iron Works (Philadelphia: Chilton Book Co., 1968).

Visual Evidence
Illustration 1: Map of Saugus, Lynn, and Nahant from Alonzo Lewis, History of Lynn, Boston, 1844.

(Courtesy of The Lynn Museum)

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Chart 1: Materials and techniques for making iron.

WATER	The Saugus River provided a means of transportation and water-power. A canal fed water from a dam upstream into sluiceways leading to each building.
WOOD	Trees were cut by woodcutters, and skilled colliers (charcoal makers) converted the wood into charcoal. Charcoal was the fuel used at the blast furnace and in the hearths.
IRON ORE	Bog iron ore, containing 30 percent to 50 percent of useable iron, was dug out of bogs, swamps, and dried up river beds by the miners. Eastern Massachusetts was found to have large quantities of bog ore.
FLUX	Flux was a substance that combined with the impurities in the iron ore to free the iron from the ore. Gabbro, a dark igneous rock containing calcium carbonate, was transported from Nahant and used as a flux at the Saugus Iron Works.

Saugus was chosen as the site for an ironworks because of the availability of the four necessary natural resources--water, iron ore, charcoal, and flux.

Questions for Illustration 1 & Chart 1

1. Study Illustration 1 and Chart 1. Illustration 1 is a section of a 19th-century map drawn to show how the region looked in the 1600s and 1700s. Locate the towns of Saugus, Lynn, and Nahant, and the site of the ironworks.

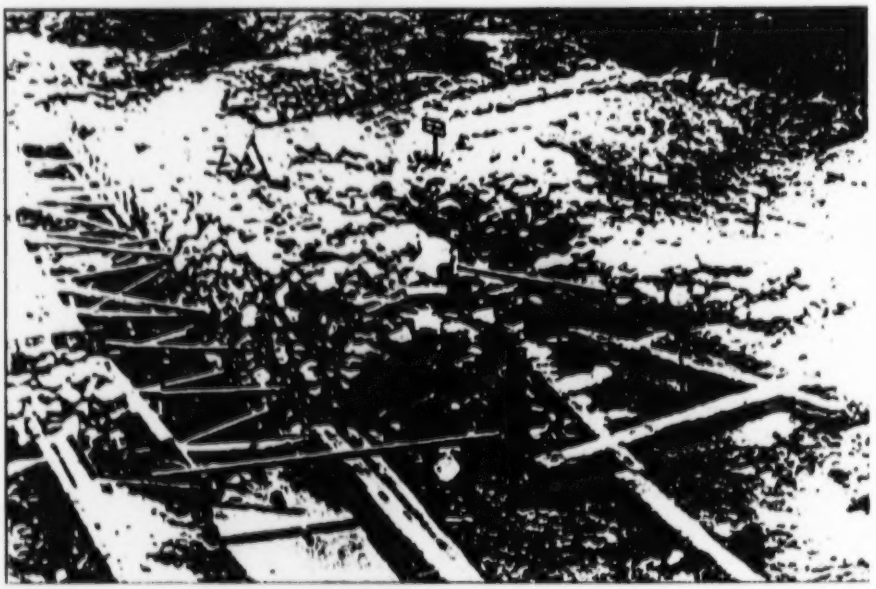
2. Using Illustration 1 and Chart 1, suggest why Saugus might have been a good spot for an ironworks. Why would it have been important for an iron furnace to be close to needed raw materials?

3. Locate the sites where the natural resources described in Chart 1 were found. How do they think gabbro was transported to the ironworks from Nahant?

4. What can you conclude about the relationship between the location of natural resources and the establishment of the industry? What can you conclude about where the iron products would be marketed?

Visual Evidence

Photo 1: Excavation at the Saugus Iron Works site, c. 1949.



(Saugus Iron Works National Site)

Photo 2: Artifact found at the Saugus Iron Works site.

(Saugus Iron Works National Site)

Archeologist, Roland Wells Robbins, who excavated the ironworks was quoted as saying, "I scraped away earth from two great wooden beams that ran in a V-shape toward the center of the stone foundation. These timbers suddenly seemed to give shape to what had seemed a formless pile of boulders and I was now convinced that the stones had been the furnace."[1] The interlocked beams formed a base to hold two great bellows that fanned the furnace constructed of the stones shown in the background of Photo 1.

Since there were no sketches or diagrams to show how this particular ironworks looked, archeologists had to rely on their knowledge of what elements would be found at a typical ironworks. Keep in mind that the reconstruction, which was completed in 1954, was necessarily partly conjectural and that Robbin's archeological methods were not as scientific or precise as those practiced by archeologists today.

Archeologists knew little about the ironworks before the excavation. The artifact in Photo 2 helped prove that there was a rolling and slitting mill on the site. The artifact is a partially slit flat made of wrought iron, approximately 8 to 10 inches long, about a half-inch thick and 3 inches wide. Because it was not cut all the way through, the artifact provided evidence that the slitting process took place at the site. Furthermore, the size of the artifact suggested the size of the equipment that produced it.

One of the reasons this evidence was so important was that the information it revealed was unexpected. It was a working assumption that this was an ordinary, possibly a rather primitive, furnace. This piece of physical evidence, combined with documentary evidence, changed the scholars' ideas of what the ironworks was like and of how advanced this New England furnace was for its time.

[1]*Roland Wells Robbins and Evan Jones, Hidden America (New York: Knopf, 1959), 44.*

Questions for Photos 1 & 2

1. Examine Photo 1 and describe what you see. Can you speculate which ironworks structure this might be?

2. How might the quotation from the archeologist help you conclude how archeologists work and the role archeology played in the reconstruction of the ironworks?

3. How would students have felt if they had been Roland Wells Robbins and found this kind of clue? Would they have hypothesized that they had found the remains of an iron furnace? Why or why not?

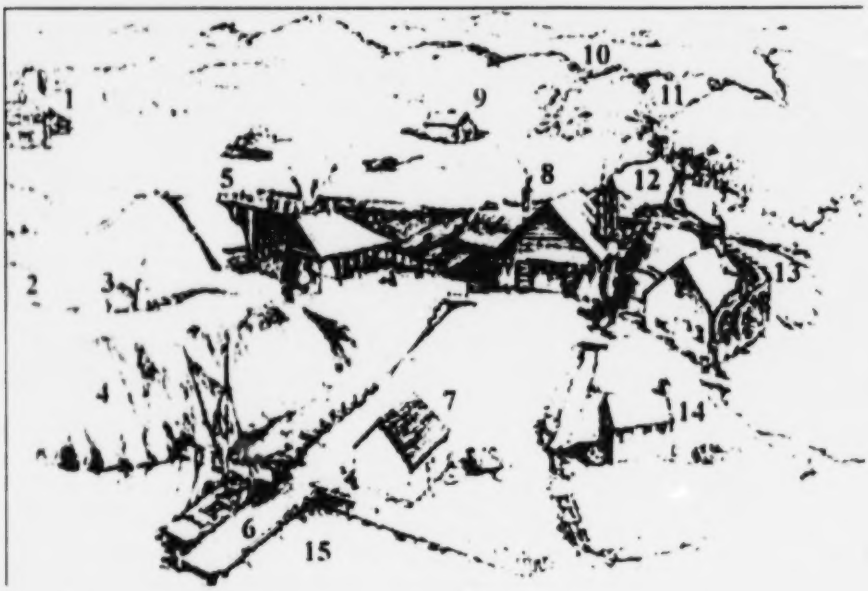
4. Examine Photo 2, which shows an artifact found at the site of the ironworks. What is it? How was it used?

5. What can you conclude about the role artifacts can play in learning about the past?

Visual Evidence
Photo 3: Reconstructed Ironworks Buildings

(Saugus Iron Works National Historic Site)

Drawing 1: Artist's conception of Saugus Iron Works in 1650, by Charles H. Overly, 1953.



(Saugus Iron Works National Historic Site)

Key to Drawing 1:

1. Ironworks House
2. Grist mill
3. Joseph Jenks' blacksmith forge
4. Slag pile
5. Blast furnace
6 Dock
7. Warehouse
8. Forge
9. Charcoal storage house
10. Great Pond (main water supply)
11 Canal to ironworks
12. Holding Pond
13. Rolling and slittingmill
14. Blacksmith shop
15. Saugus River

Questions for Photo 3 and Drawing 1

1. Photo 3 shows how the reconstructed ironworks looks today. What are your impressions of the site? What adjectives would you use to describe the scene? What characteristics of the environment give you clues about its location?

2. Can you identify the furnace, the forge, and the rolling and slitting mill in Photo 3? In which building would you have liked to work? Of the jobs mentioned in the readings, which would you have liked to have? If you had lived in the 17th century, would you have considered the ironworks a good place to work? Why or why not?

3. Compare Photo 3 and Drawing 1. Does the artist's sketch or the photo provide a better understanding of the site? What buildings or other features appear in the artist's sketch but not in the photo?

4. Why do you suppose only some of the buildings have been reconstructed? What seems to be missing from both illustrations that would give us a better understanding of the ironworks?

Putting It All Together

The following activities will help students to understand how archeologists must work with only a few jumbled, and sometimes irrelevant, artifacts as they attempt to create a scholarly and useful explanation of life in the past. Students will also have an opportunity to study the past industrial experience of their own community and be able to compare that story with the narrative of the Saugus Iron Works and the town of Hammersmith.

Activity 1: Archeology

Divide students into groups of three or four and have each group choose an object (or "artifact") that they think would reveal something interesting about the culture of our time to future archeologists. Suggest to students that they try to choose an object that may not be readily identified by their classmates, although this is not necessary. Encourage students to think of their own ethnic and geographic identities as well as the general traits of the society in which we live. Ask the groups to keep their object secret from the rest of the class for a day or two while they discuss among themselves its general characteristics and use. They should think about what the object and its use, construction, and appearance reveal about society. They should also try to anticipate the kinds of questions the rest of the class might ask about it.

Explain that the point of the activity is to see how much information the rest of the class can derive about our culture from a simple artifact. As each group displays its object, ask the rest of the class to act as archeologists of the future who are not familiar with these artifacts. They are to pose questions to the group, first about the object's use or purpose, and then about what they think that tells us about the lives and culture of the people who created and used it. After the class has discussed each of the artifacts, have them think about what they learned from trying to figure out the use of the artifacts. Ask if any of the items were as hard to identify as the partially slit piece of iron that helped the archeologist identify the existence of the rolling and slitting mill. The following questions might facilitate the discussion:

1. Why did your group choose its particular object? Would an archeologist of a hundred years from now have learned a lot about us, or would the object have given him or her an erroneous idea about our society?

2. Why is it necessary to have some background knowledge about a group of people when you are trying to use artifacts to learn about their past?

3. Were any of the objects chosen by the groups silly? How would they have confused an archeologist?

4. Taking into consideration all the objects displayed by the class, what conclusions could you draw about our society?

Activity 2: Researching Industries in the Local Community

Most communities have an industrial history of some kind. Have the students research and, if possible, visit sites in their own community to discover what elements of its early growth were alike or different from the development of the Saugus Iron Works and the settlement of Hammersmith. Some questions students might investigate include:

1. What was the first industry in your community?

2. Are there or were there any "heavy industries" in your community or nearby? What happened to them? (A heavy industry is defined as an industry producing or refining basic materials, such as steel or coal, used in manufacturing.)

3. What is a factory town? Are there any factory towns which exist today in your state or region?

4. How have changes in technology influenced the development of industry in your community?

5. Has the disappearance of any local industry caused severe unemployment in your community? How has the community responded?

After students have completed their research, have them discuss the history of the economic base of the town or city. Then ask each student to write a short paper in which they describe an industry they would like to promote--as Winthrop promoted ironmaking for Saugus. They should describe how they would refine their idea, how they might find investors, what working conditions would be like, and how the industry would affect the people in the community. Read two or three of the papers to the class and then hold a general discussion about the impact industry has on the daily lives of those involved.

Saugus Iron Works: Life and Work at an Early American Industrial Site --Supplementary Resources

By looking at Saugus Iron Works: Life and Work at an Early American Industrial Site, students learn about the first successful integrated ironmaking plant in colonial America. Those interested in learning more will find that the Internet offers a variety of interesting materials.

Saugus Iron Works National Historic Site http://www.nps.gov/sair/

Saugus Iron Works National Historic Site is a unit of the National Park System. Visit the park's web pages to learn more about the park's history and visiting the site.

National Park Service History: Categories of Significance
http://www.cr.nps.gov/history/catsig/labor.htm

At the dawn of the 21st century, the National Park System comprises 378 units or areas. These areas of historic, cultural, natural, scenic and scientific importance include resources that are of such national significance as to justify special protection and recognition by various acts of the United States Congress. Saugus Iron Works is recognized as being nationally significant under the theme of labor. Visit this page to understand why.

Library of Congress http://memory.loc.gov/ammem/amhome.html

Search the American Memory Collection for primary resources on Saugus Iron Works, iron making, and colonial America.

American Colonial History http://www.hc.cc.tx.us/library/histucl.htm

Explore the Howard College Libraries' page on American Colonial History to locate a variety of helpful Internet sites that provide primary source materials and information on the 13 original, founding colonies in America, including Massachusetts.

Modern History Sourcebook http://www.fordham.edu/halsall/mod/modsbook.html

The Modern History Sourcebook is one of a series of internet history primary sourcebooks created by the History Department of Fordham University in New York. Included on the web page are documents pertaining to colonial America, including writings from John Winthrop. Also available are documents highlighting the Industrial Revolution from as early as the 17th century.

National Park Service: Archeology and Ethnography Archeology and Ethnography http://www.cr.nps.gov/aad/

This organization is a division of the National Park Service. Visit the program's Web pages to better understand the Federal Archeology Program, including the history of archeology, protection of archeological sites, and managing cultural resources.

Middle Tennessee State University: Teaching Archeology
http://www.mtsu.edu/~then/Archeology/index.html

The Heritage Education Network web page is for educators who want to know more about incorporating archeology into their classrooms. What is archeology? Why is it important? Where can I find classroom materials on archeology? How can I use them in the classroom? What are some of the resources in my state that I can go to for more help and information? This web site answers these questions and much more.

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